

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method for the production of an aromatic or hetroaromatic fluorine-labelled compound comprising fluoridation of an iodonium salt of Formula (I) or (II):



wherein:

Q = phenyl, or phenyl substituted with one or more of acetyl, C₁-3 alkyl or -O-C₁-3 alkyl
each of R¹, R², R³, R⁴ and R⁵ is independently hydrogen, O-(C₁₋₁₀ alkyl) or C₁₋₁₀ alkyl or ~~protected versions thereof~~ R¹-R⁵ is independently selected from hydrogen, C₁₋₃ alkyl and -O-(C₁-C₃ alkyl); and

Y⁻ is a counter ion such as trifluoromethane sulfonate (triflate), perfluoro C₂-C₁₀ alkyl sulphonate, trifluoroacetate, methane sulfonate (mesylate), toluene sulfonate. (tosylate), tetraphenylborate;

to give a product of general formula (III):



~~where Q is substituted with one or more substituents selected from C₁₋₁₀-alkyl, O(C₁₋₁₀-alkyl), C(=O)C₁₋₁₀-alkyl, C(=O)NR⁶(C₁₋₁₀-alkyl), (C₁₋₆-alkyl)-O-(C₁₋₆-alkyl), C₅₋₁₄-aryl, O(C₅₋₁₄-aryl), C(=O)C₅₋₁₄-aryl, C(=O)NR⁶(C₅₋₁₄-aryl, C₅₋₁₄-heteroaryl, O(C₅₋₁₄-heteroaryl), C(=O)C₅₋₁₄-heteroaryl, C(=O)NR⁶(C₅₋₁₄-heteroaryl), C₃₋₁₀-cycloalkyl, O(C₃₋₁₀-cycloalkyl), C(=O)(C₃₋₁₀-cycloalkyl), C(=O)NR⁶(C₃₋₁₀-cycloalkyl), C₃₋₁₀-heterocyclyl, O(C₃₋₁₀-heterocyclyl), C(=O)(C₃₋₁₀-heterocyclyl), C(=O)NR⁶(C₅₋₁₄-heterocyclyl) or protected versions thereof, when Q is substituted with an electron donating substituent, Q also contains one or more electron withdrawing groups to ensure Q is electron deficient;~~
and wherein said fluoridation is carried out with a fluoride ion source characterised in that the reaction solvent is either 100% water or a mixture of water and a water miscible solvent.

2. (Cancelled)
3. (Cancelled)
4. (Previously presented) A method as claimed in claim 1, wherein the water miscible solvent is acetonitrile, ethanol, methanol, tetrahydrofuran or dimethylformamide.
5. (Previously Presented) A method as claimed in claim 1 wherein the volume:volume ratio of water:water-miscible solvent is between 1:99 and 1:1.
6. (Original) A method as claimed in claim 5 wherein the volume:volume ratio of water:water-miscible solvent is from 10:90 to 30:70.
7. (Previously Presented) A method as claimed in claim 1, wherein the fluoride ion source is potassium, caesium or sodium fluoride.
8. (Cancelled)

9. (Cancelled)

10. (Previously Presented) A method as claimed in claim 1 wherein, in the compound of Formula II, the "solid support" is polystyrene, polyacrylamide, polypropylene or glass or silicon coated with such a polymer.

11. (Previously Presented) A method as claimed in claim 1 wherein the solid support is in the form of small discrete particles or is a coating on the inner surface of a reaction vessel.

12. (Previously Presented) A method as claimed in claim 1, wherein, in the compound of Formula II the "linker" is C₁₋₂₀ alkyl or C₁₋₂₀ alkoxy, attached to the resin by an amide ether or a sulphonamide bond or a polyethylene glycol (PEG) linker.

13. (Previously Presented) A method as claimed in claim 1
wherein R⁶ is H, C₁-C₆ alkyl, C₃-C₁₀ cycloalkyl, C₃-C₁₀ heterocyclyl, C₄-C₁₀ aryl or C₄-C₁₀ heteroaryl;
any of which may optionally be substituted with OH, NHR⁶, COOH or protected versions
any of these groups; or alternatively
any two adjacent substituents may form a four- to six-membered carbocyclic or heterocyclic ring, optionally fused to a further aromatic, heteroaromatic, carbocyclic or heterocyclic ring.

14-15. (Cancelled)

16. (Previously Presented) A method as claimed in claim 1, wherein the fluorine-labelled compound is an [¹⁸F]-labelled compound and the fluoride ion source is a source of ¹⁸F⁻.

17. (Cancelled)

18. (Previously Presented) A method as claimed in claim 1, further including, in any order, one or more of the following steps: removal of excess $^{18}\text{F}^-$, for example by ion-exchange chromatography; and/or

- (i) removal of the protecting groups; and/or
- (ii) removal of organic solvent; and/or
- (iii) formulation of the resultant compound as an aqueous solution.

19. (Previously Presented) A kit for the production of an aromatic fluorine-labelled compound, the kit comprising:

- (i) a vial containing an aqueous solvent for dissolving the fluoride ion source; and
- (ii) a reaction vessel containing an iodonium salt of claim 1.

20. (Original) A kit as claimed in claim 19, wherein the solvent is 100% water.

21. (Original) A kit as claimed in claim 19 wherein the solvent is a mixture of water and a water miscible solvent.

22. (Original) A kit as claimed in claim 21, wherein the water miscible solvent is acetonitrile, ethanol, methanol, tetrahydrofuran or dimethylformamide.

23. (Previously Presented) A kit as claimed in claim 21 wherein the volume:volume ratio of water:water-miscible solvent is between 1:99 and 1:1.

24. (Original) A kit as claimed in claim 23 wherein the volume:volume ratio of water:water-miscible solvent is from 10:90 to 30:70.

25- 26. (Cancelled)

27. (Previously Presented) A kit as claimed in claim 19, wherein the reaction vessel is a cartridge or a microfabricated vessel.

28. (Previously Presented) A kit as claimed in claim 19, further comprising a source of fluoride ions.